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Like most of the old Renaissance specimens it stands on turned legs, an arrangement hardly to be dispensed with in carpeted rooms.

Plate 87. — Carvings in Wood in the Mayence Cathedral.

In a Side Chapel in the Mayence Cathedral there is a range of wooden stalls and panelling dating from the beginning of the 16th century originally intended for the Chapel of the Electoral Palace in Mayence, a characteristic and noble building of German Renaissance. The projecting elbows of the stalls, giving free scope to the artist's imagination and skill, show an exuberance of decorative features carved in the most perfect style. Above the range of stalls the

panelling is carried up to a considerable height, and crowned with an entablature supported by fluted pilasters which divide the woodwork in plain compartments. These pilasters are enriched on their lower parts with carvings showing a great variety of the most charming decorative motives of which we choose for the present four characteristic specimens. The enriched portion of pilasters is 37 cm. high and 19 cm. broad.

Plate 88. — Embossed Leather Tapestry, Italian; end of 16th century.

This interesting pattern was probably used for the upper part of a wall, the lower part being wainscoted. Height 1,20 m. Colors blue and gold.

VARIOUS.

New Colours from Iron.

A method of preparing certain colouring matters similar to "English red" and "French ochre" has lately been patented in Germany by M. Steinau, of Brunswick. It consists in producing a pure iron oxide simply with water and the oxygen of the air. Wrought-iron turnings are placed on a sieve in a vessel, in which water is forced up and down by a piston, so that the turnings are alternately in water and in air, which latter, entering the vacuum with force, has a strong oxidising action. After the piston has worked twelve hours, the hydrated oxide is allowed to settle at the bottom, then removed, filtered and dried.

Paper Car Wheels.

It is a somewhat remarkable fact that railway car wheels have been the subject of more than 600 English patents during the last half century. In all the various designs and improvements covered by this long list of foreign patents, the use of paper for the body of car wheels seems never to have been thought of. It was reserved for an American inventor to discover, what now seems so simple, that compressed paper combines all the essential requisites for that purpose. In 1869, Mr. R. N. Allen, of Pittsford, Vermont, a railroad engineer of long experience, brought out the first set of paper car wheels ever made. They were soon after placed under one of the Pullman sleeping cars, and there showed such remarkable results in mileage and durability as to fully justify the inventor's claims. The manufacture of the wheel was at once proceeded with, and they have now been in use a sufficient length of time on some of the principal railroads of the country to entitle them to a more extended public notice and description. As now manufactured, the wheel may be described in general terms as consisting of three parts — a cast-iron hub, steel tire, and compressed paper body or filling. The paper employed for this purpose is ordinary thick boards, first pasted together in sections of a few sheets, and subjected to powerful hydraulic pressure, then pasted in sections of several inches until the requisite thickness is obtained. At each stage of the process the paper is thoroughly seasoned or dried in rooms fitted up for this purpose, the time required for completing a single block ready for fitting to the wheel being from six to eight weeks. When thus prepared the blocks are turned up in a lathe and accurately fitted to the tire and hub, after which they are forced together by hydraulic pressure. The paper block or disc is inclosed between wrought-iron plates $\frac{1}{4}$ inch in thickness, held by two circles of bolts, the inner passing through the flange

of the hub, and the outer circle through an interior web formed on the tire, thus firmly securing all the parts together. The bolts used are all turned and accurately fitted. This form of tire, peculiar to the paper wheel, has many important advantages that will doubtless be apparent to practical railroad men. The web on the tire through which the parts are bolted is $\frac{3}{4}$ inch in thickness and extends to a depth of $2\frac{1}{2}$ inches. It will be readily seen that this web not only adds greatly to the strength of the tire, but the mode of fastening it to the body of the wheel prevents the possibility of the tire leaving the wheel in case of fracture. The bolt hole through the web of the tire being elongated, and the side plates made of a less diameter than the inner periphery of the tire, there is no direct metallic connection between the tire and the hub of the wheel. This form of construction, which enables the paper block to take up or absorb concussion, prevents, in a great degree, crystallisation of the axle, makes the wheel much easier on the track, and greatly lessens the noise, thus rendering it especially desirable for drawing-room and sleeping cars. It may be added that the paper, being practically indestructible, can be used over and over again, the worn-out tire being replaced with new. The manufacture of this wheel is now carried on extensively at Hudson, New York, by the Hudson Paper Car Wheel Company. Many wheels are in use on our leading railroads and under the Pullman palace cars, with unvarying testimony, we are assured, as to their superiority.

Iron Age.

Charcoal Pencils.

The "Correspondenz" extracts from the "*Papier-Zeitung*" a description of a new sort of charcoal for drawing with. The ordinary drawing charcoal is made by charring pieces of wood, so that every knot in the wood remains, and there are often scratchy pieces and bits of unequal softness. The new pencils, which have been patented by Herr Heilmann, are made as follows: Saw-dust of wood, taken from lime, willow or even poplar trees, is pressed between wooden moulds having grooves about the size of those made for lead in lead-pencils; it is then dried in air and charred in a retort. The hardened sticks are now rubbed smooth, cased in paper and packed in bundles of twenty-five. The fibers of the wood having been freed from every foreign substance, the charcoal made from it can be moistened with any sort of liquid. Thus, moistened with gelatine it can be used instead of black chalk or it may be moistened with linseed oil or with lime water. The charcoal is also prepared of a catechu brown.